

Claims

What is claimed is:

1. A method for dynamically measuring a payload weight for a machine having at least one cylinder for elevating a payload carrier, the cylinder being connected to a fluid circuit having an actuating fluid, comprising:

    determining a calibration weight associated with the payload carrier;

    determining an uncompensated payload weight;

    determining a temperature gain associated with the actuating fluid in response to at least the calibration weight and the uncompensated payload weight; and

    determining the payload weight in response to at least the uncompensated payload weight and the temperature gain.

2. The method, as set forth in claim 1, wherein the step of determining the calibration weight includes:

    lifting a first payload having a first payload weight;

    sensing a first plurality of pressure values of the actuating fluid during the lifting of the first payload;

    lifting a second payload having a second payload weight; and

    sensing a second plurality of pressure values of the actuating fluid during the lifting of the second payload.

3. The method, as set forth in claim 2, wherein the step of determining the uncompensated payload weight includes:

    lifting a third payload having a third payload weight; and

sensing a third plurality of pressure values of the actuating fluid during the lifting of the third payload.

4. The method, as set forth in claim 1, further including:  
establishing a first temperature of the actuating fluid associated with the calibration weight; and  
and wherein the temperature gain associated with the actuating fluid is determined in response to at least the first temperature of the actuating fluid.

5. The method, as set forth in claim 4, further including:  
establishing a second temperature of the actuating fluid associated with the uncompensated payload weight; and  
wherein the payload weight is determined in response to at least the second temperature.

6. A method for dynamically measuring a payload weight for a machine having at least one cylinder for elevating a payload carrier, the cylinder being connected to a fluid circuit having an actuating fluid, comprising:  
determining a calibration weight associated with the payload carrier;  
determining a calibration temperature of the actuating fluid associated with the calibration weight;  
determining an uncompensated payload weight;  
scaling the calibration temperature by a scaling function of the uncompensated payload weight and the calibration weight; and  
determining the payload weight as a function of at least the uncompensated payload weight and the scaled calibration temperature.

7. The method, as set forth in claim 6, wherein the scaling function comprises a ratio of the uncompensated payload weight to the calibration weight.

8. The method, as set forth in claim 6, further including:  
determining a current temperature of the actuating fluid associated with the uncompensated payload weight; and  
wherein the payload weight is determined as a function of at least the current temperature.

9. The method, as set forth in claim 8, wherein the payload weight is determined by multiplying the scaled calibration temperature by the current temperature and subtracting from the uncompensated payload weight.

10. The method, as set forth in claim 6, wherein the step of determining the calibration weight includes:  
lifting a first payload having a first payload weight;  
sensing a first plurality of pressure values of the actuating fluid during the lifting of the first payload;  
lifting a second payload having a second payload weight; and  
sensing a second plurality of pressure values of the actuating fluid during the lifting of the second payload.

11. The method, as set forth in claim 6, wherein the step of determining the calibration temperature includes:  
sensing a first lift temperature of the actuating fluid during a first lift;  
sensing a second lift temperature of the actuating fluid during a second lift;

averaging the first lift temperature and the second lift temperature;  
and

establishing the calibration temperature in response to the average.

12. The method, as set forth in claim 6, wherein the step of determining the uncompensated payload weight includes:

lifting an unknown payload weight; and

sensing a plurality of pressure values of the actuating fluid during the lifting of the unknown payload weight.

13. An apparatus for dynamically measuring a payload weight for a machine having at least one cylinder for elevating a payload carrier, the cylinder being connected to a fluid circuit having an actuating fluid, comprising:

calibration means for determining a calibration weight associated with the payload carrier;

temperature means for determining a first and second temperature of the actuating fluid;

payload means for determining an uncompensated payload weight; and

compensating means for determining the payload weight.

14. The apparatus, as set forth in claim 13, wherein the compensating means comprises:

scaling means for adjusting the first temperature as a function of the calibration weight and the uncompensated payload weight; and

calculating means for determining the payload weight as a function of the uncompensated payload weight, the scaled temperature, and the second temperature.